



Serial No.: 10/066,738  
Inventor(s): Ramesh Keshavaraj

U.S. PTO Customer No. 25280  
Case No.: 2102REI

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Application of: Ramesh Keshavaraj

Serial Number: 10/066,738

Filed: February 4, 2002

For: **AIRBAG FABRIC POSSESSING VERY LOW COVER FACTOR**

Group Art Unit: 1771

Examiner: Singh, Arti. R.

Commissioner for Patents  
PO Box 1450  
Alexandria VA 22313-1450

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Date: August 15, 2008

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**REPLY TO DECISION ON APPEAL AND REQUEST TO  
RE-OPEN PROSECUTION TO CONSIDER NEW FACTUAL EVIDENCE**

In response to the Decision on Appeal, Applicant submits a SECOND SUPPLEMENTAL DECLARATION OF RAMESH KESHAVARAJ. The Decision on Appeal pursuant to 37 CFR Section 41.50(b)(1), invites applicant to request that prosecution be reopened for consideration of additional evidence. The Decision (pages 13-16) suggested that additional evidence from applicant could be helpful in the issues on appeal. Therefore, applicant requests that the enclosed SECOND SUPPLEMENTAL DECLARATION OF RAMESH KESHAVARAJ be considered in its entirety for all purposes.

A Request for Continuing Examination is filed pursuant to this Reply, so that the examiner will re-open prosecution and consider this new factual evidence, in light of the opinion of the Board of Appeals.

The new ground of rejection under section 103 is all that remains in this application. The rejection of claims 1-2, 6-9, 11-12, 18-21, 25, 28-29, 32-33, 36-37, and 40-41 are made based upon U.S. Patent No. 6, 291, 040 to Moriwaki et al. (hereafter "the "040 patent" or "Moriwaki patent"). However, the evidence presented with this Reply fully addresses that rejection.

MORIWAKI DOES NOT RENDER OBVIOUS THE INVENTION

Moriwaki does not render obvious the invention of this application. Moriwaki teaches away from the invention, because it suggests using a fabric cover factor that far exceeds the cover factor level of applicant's claims. Further, a person of skill in the art reading Moriwaki would not be inspired to create the invention, and in fact would be taught to proceed in the opposite direction. Moriwaki does not teach any reasonably commercially useful airbag having a cover factor less than 1600. Further, the airbags taught in Examples 1-9 of Moriwaki suggest much higher cover factor/higher density fabric cover, and do not exhibit the low air permeability levels achieved in this invention.

The Moriwaki comparative example 5 does not teach or suggest the invention. This comparative example was not favored by Moriwaki. This comparative example actually discourages a person of skill in the art from using low cover factor, thereby teaching away from the invention. Further, this example of Moriwaki also teaches a denier of 840, which is substantially higher than the claimed yarn denier in the invention of "about 100 to about 630". Further, this Moriwaki example discloses an unusually thick coating (i.e. the coating thickness reported is 85 microns as specified in Col 11, line 46). The fact that large amounts of coating may be applied to in a heavy denier (840 denier fabric) to reduce air permeability zero does not represent a teaching of the invention of this application, and it is not preferred by a person of skill in the art.

The invention as described and claimed is directed to a novel product that solves the problem of making a cost effective airbag using a woven fabric substrate with a minimal fabric density (i.e. low cover factor of below about 1600), using yarns from about 100 to about 630 denier, and achieving a low air permeability. Second Supplemental Declaration of Ramesh Keshavaraj (hereafter "Decl."), paragraph 7. In the past, a challenge has been to construct an airbag using less fabric density (low cover factor, low denier), and reduced amounts of coating, while still achieving a very low air permeability. Decl., para. 7. It has been known that one could use very, very large amounts of coating to compensate for low fabric density, and achieve a low or no permeability airbag. Decl., para. 7. But, unfortunately, such large amounts of coating are much too expensive for real world applications in which the cost of airbags must remain at a minimum. Decl., para. 7. Coating is expensive, and airbag designers use only the minimal amount of coating to achieve the desired effect upon the fabric. Decl., para. 7. Furthermore, thick coatings exhibit problems with fabric foldability, as further discussed herein. An airbag must fold easily and tightly to fit into the receptacle in the automobile that holds the airbag for deployment. The invention comprises a product that employs a minimal fabric density, using about 100 to about 630 denier yarn size range, and also achieving the claimed low air permeability. Moriwaki does not disclose or render obvious the invention.

Comparative Example 5 of Moriwaki  
Discourages Use of Low Cover Factor

Moriwaki in comparative example 5, as taught in the reference, would discourage a person of skill in the art from using low cover factor. Decl., para. 7-8. Comparative

example 5 in Moriwaki is the only example disclosed on that particular reference that is reported to have a permeability of zero (i.e. 0 cc/cm<sup>2</sup>/sec). Decl. , para. 7-8 But, as reported in the Decision on Appeal, this example of Moriwaki also has a denier of 840, which is substantially higher than the claimed yarn denier in the invention of "about 100 to about 630". Decl. , para. 7-8 Further, this Moriwaki example discloses an unusually thick coating (i.e. the coating thickness reported is 85 microns as specified in Col 11, line 46). Decl. , para. 7-8 The fact that large amounts of coating may be applied to in a heavy denier (840 denier fabric) to reduce air permeability zero does not represent a teaching of the invention of this application. Decl. , para. 7-8 This Moriwaki example uses a relatively heavy 840 denier nylon 6,6 fabric at a cover factor of 1476. Decl. , para. 7-8. As the cover factor cited is low, the coating weight or thickness needs to be very, very high in order to achieve air permeability of zero. Decl. , para. 7-8. This 85 micron thickness is a very high coating thickness. This teaching would discourage a person of skill in the art from using this example. Decl. , para. 7-8. Such a high coating thickness would not present a commercial viable option, due to excessive cost of the large amount of coating required to achieve acceptable air permeability. Decl. , para. 7-8. Moriwaki's actual claimed invention was not comparative example 5, however. Moriwaki's teachings, and his alleged invention, was directed to other embodiments. Decl. , para. 7-8. These other embodiments, favored by Moriwaki, use much higher cover factor. Decl. , para. 7-8. Moriwaki's teaching was to weave *higher construction cover factor fabrics* as specified in Table 1 of the Moriwaki patent, as in examples 1-9. Decl. , para. 7-8.

Morakawi provides no examples of low fabric construction which also achieving

an air permeability of zero (0 cc/ cm<sup>2</sup>/sec). Decl. para. 10. In fact, the Table of the Declaration shows that Moriwaki does not provide in examples 1-8 any embodiments that reveal an air permeability less than 0.5 cfm, as claimed in the present invention. Decl. para. 10. Moriwaki's disclosure does not teach the invention. Moriwaki's teachings actually are contrary to the invention, since Moriwaki actually suggests making a fabric using the highest cover factor fabric possible on the weaving machine, and then applying a light weight thickness coating further to reduce the air permeability to a smaller degree --- but with examples that do not achieve air permeability of less than 0.5 cfm. Decl. para. 10.

Fabric Foldability:

Moriwaki monitored fabric foldability because foldability of the comparative example 5 cited with 840 denier fiber (i.e. Comparative example 5 of Moriwaki) was inferior. Decl. para. 11. This may have been because of the unusually and unsustainable heavier coat weight/ thickness that would be required in such device in order to achieve zero air permeability. Again, the actual recommended examples that are cited by Moriwaki are very high cover factor fabrics that are known to be poor in terms of foldability. Decl. para. 11.

The foldability as described in Col. 6, line 27 of Moriwaki is vague and cannot be replicated or verified by one skilled in the art as it is described as a relative value in a unique airbag module with a reference of a silicone coated airbag with 45 grams per square meter coating weight. Decl. para. 12. It is well known that when Moriwaki patent application was filed in 1999, silicone coated fabric was the fabric of choice in Japan. Decl. para. 112. Therefore, silicone coated fabric should have been used as a

prior art example rather than comparative example 5 -- which instead uses a relatively heavy coating of chloroprene rubber in order to draw a distinction from the prior art.

Decl. para. 12.

The Moriwaki embodiments would not provide foldability that is suitable or comparable to the claimed invention of this application. Decl., para. 14. Even Moriwaki himself, in his application, states that foldability of his comparative example 5 is poor and undesirable:

"The base fabric for air bags of Comparative Example 5 was excellent in the prevention of fraying and low air permeability, *but was so hard as to impair foldability and to complicate processing disadvantageously having regard to productivity*";

US Patent No. 6, 291, 040 (Moriwaki), col. 9, lines 7-11 (emphasis supplied).

It that even Moriwaki himself was indicating the inoperability of his Comparative Example 5, as unsuitable for use for reasons of foldability and also processing disadvantages or problems. Decl., para. 14.

Dr. Keshavaraj, the inventor of the pending case, obtained samples of fabrics made in accordance with the Moriwaki patent. Decl, para. 15. Specifically, he obtained an example of the Toray fabric which was a commercially available fabric manufactured in accordance with the '040 patent having a cover factor of 1885, with 420 denier nylon 6,6 yarns and a thread count of 46 X 46 threads per inch in both the warp and weft directions. Decl. para. 15. This fabric had approximately 5 micron thick coating of what is believed to be an anionic ionomer type polyester based urethane resin (from the examples of the '040 patent). Decl. para. 15. He tested that fabric (the "Moriwaki fabric") which was made according to the '040 patent, and the Moriwaki fabric had an air permeability of 11 cc/sq. cm /sec. Decl. para. 15.

He also tested a fabric made according to the invention claimed in this pending application using the test method outlined in the '040 patent, to make a direct comparison. Decl. para. 16. Air permeability of the fabric of the invention was tested per the reported method of Moriwaki et al (cc/cm<sup>2</sup>/sec at 0.2 Kg/cm<sup>3</sup> pressure drop.) Using the teachings of the invention, the permeability is minimal or zero. Decl. para. 16. Thus, the invention disclosed here is superior to the teachings of Moriwaki with regard to air permeability, and there is no teaching of the achievement of the invention in the disclosure of Moriwaki. Decl. para. 16. Moriwaki does not disclose the invention of this application. Thus, not only does Moriwaki fail to disclose a fabric achieving the air permeability at comparable conditions, but Moriwaki also does not teach the combination of the invention with regard to minimal fabric density, about 100 to about 630 denier yarn size range, achieving the claimed air permeability. Decl. para. 16.

The Moriwaki patent disclosure fails to teach the airbag fabric invention of this pending application. The results indicate a lack of disclosure of the claimed invention. Furthermore, this reference fails to provide instructions for altering the preferred embodiments or motivation for doing making such alterations. Thus, the invention of this application is not obvious in light of Moriwaki, and there is no evident or apparent alteration of Moriwaki comparative example 5 that would achieve the invention.

The teachings of Moriwaki are contrary to the claimed invention. The claimed invention also is not obvious in light of the disclosure set forth in Moriwaki

In the event that there are additional fees associated with the submission of these papers, Applicant hereby authorizes the Commissioner to withdraw those fees from our Deposit Account No. 04-0500. The claims are in condition for allowance, and a notice to that effect is requested. Should the Examiner find that any issues remain

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outstanding following consideration of this Response, she is invited to telephone the undersigned.

Respectfully submitted,



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